



Bulletin 4390-974250

Cut 250 Saw Use and Maintenance Manual

Part Number: 974250

Effective: September 1, 1999



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Ordering Spare Parts

- When ordering spare parts you must state:
 - Machine model**
 - Serial number**
 - Part reference number**

Without these references **we will not supply** the spare parts.
See point 10.1 – List of spare parts.

Guarantee

- The Company guarantees that the machine to which this manual refers has been designed and built to comply with safety regulations and that it has been tested for functionality in the factory.
- The machine is guaranteed for 12 months: the guarantee does not cover the electric motors, electric components, pneumatic components or any damage due to dropping or machine misuse, the failure to observe maintenance standards or bad handling by the operator.

Machine Certification and Identification

Machine Certification and Identification Marking

MACHINE LABEL

| | |
|---|-----------|
| THOMAS S.p.A. | CE |
| via Pasubio, 32 36033 ISOLA VIC. - ITALIA | |
| MODEL | CUT 250 |
| TYP | |
| SERIAL NUMBER | |
| YEAR OF MANUFACTURE | |

1 Reference to Accident-Prevention Regulations

This machine has been built to comply with the national and community accident-prevention regulations in force. Improper use and/or tampering with the safety devices will relieve the manufacturer of all responsibility.

1.1 — Advice for the operator



- Check that the voltage indicated on the plate, normally fixed to the machine motor, is the same as the line voltage.
- Check the efficiency of your electric supply and grounding system; connect the power cable of the machine to the socket and the ground lead (yellow-green in color) to the ground system.
- When the tool head is in rest position (raised), the toothed blade must be stationary.
- It is not recommended to operate saw without its shields (these are all white, blue or grey in color).
- Always disconnect the power source before changing the blade or carrying out any maintenance job, even in the case of abnormal machine operation.
- It is not recommended to disconnect the “man present” device, known more correctly in the EEC as the “safety switch with hold-down action”.
- Always wear eye protection.
- Never put your hands or arms into the cutting area while the machine is operating.
- Do not move the machine while it is cutting.
- Do not wear loose clothing, gloves that are too big, bracelets, chains or any other object that could get caught in the machine during operation; tie back long hair.
- Keep the area free of equipment, tools or any other object.
- Perform only one operation at a time and never have several objects in your hands at the same time.
- All internal and/or external operations, maintenance or repairs, should be performed in a well-lit area or where there is sufficient light from extra sources so as to avoid the risk of accidents.

1.2 — Location of shields against accidental contact with the tool

- Grey metal shield screwed onto the saw head.
- Self-regulating mobile blue plastic shield, fitted coaxially with the fixed shield.

1.3 — Electrical equipment according to European Standard “CENELEC EN 60 204-1” which assimilates, with some integrating modifications, the publication “IEC 204-1 (1992)”

- The electrical equipment ensures protection against electric shock as a result of direct or indirect contact. The active parts of this equipment are housed in a box to which access is limited by screws that can only be removed with a special tool; the parts are fed with alternating current at low voltage (24 V). The equipment is protected against splashes of water and dirt.
- Protection of the system against short circuits is ensured by means of fuses and grounding; in the event of motor overload, protection is provided by a thermal probe.
- In the event of a power cut, the specific start-up button must be reset.
- The machine has been tested in conformity with point 20 of EN 60204.

1.4 — Emergencies according to European Standard “CENELEC EN 60 204-1 (1992)”

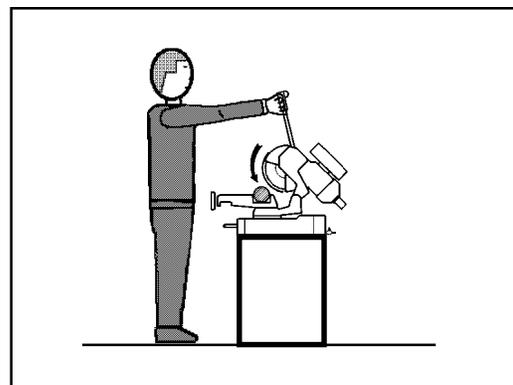
- In the event of incorrect operation or of danger conditions, the machine may be stopped immediately by pressing the red mushroom button.

NOTE: Resetting of machine operation after each emergency stop is achieved by reactivating the specific restart button.

2 Recommendations and Advice for Use

2.1 — Recommendations and advice for using the machine

- The machine has been designed to cut tubing with different shapes and profiles.
- Only one operator is needed to use the machine.



- To obtain break-in of the machine it is advisable to start using it at intervals of about half an hour. This operation should be repeated two or three times, after which the machine may be used continuously.
- Before starting each cutting operation, ensure that the part is firmly gripped in the vice and that the end is suitably supported.
- Do not use blades of a different size from those stated in the machine specifications.
- If the blade jams in the tube, release the running button immediately, switch off the machine, open the vice slowly, remove the part and check that the blade or its teeth are not broken. If they are broken, change the blade.
- Before carrying out any repairs on the machine, consult the dealer or call Parker Tube Fittings Division.

3 Technical Characteristics

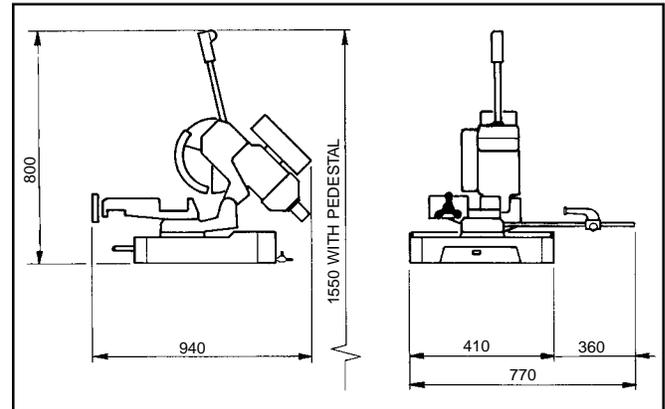
3.1 — Table of cutting capacity and technical details

| Cutting Capacity |  |  |  |  |
|------------------|--|--|--|--|
| 90° | 30 | 70 | 65 | 100 x 45 |
| 45° DX | 25 | 60 | 55 | 65 x 150 |

- Three-phase el. motor for 2-speed blade rotation kW 0.75 ÷ 0.95
- Single-phase el. motor for 1-speed blade rotation kW 0.9
- Reduction gear in an oil bath Ratio = 1:32
- Maximum blade diameter mm 250
- Blade rotation speed rpm 40 ÷ 80
- Vice opening mm 105
- Machine weight kg 80

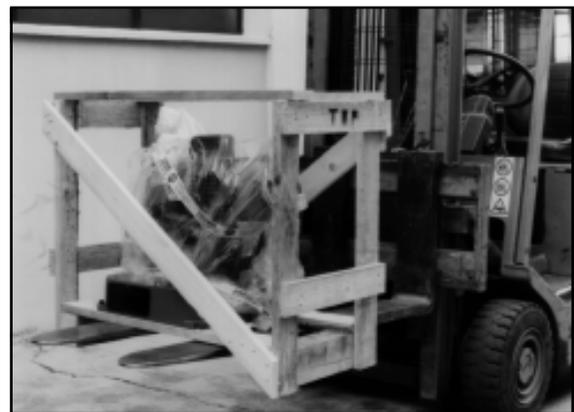
4 Machine Dimensions – Transport – Installation – Dismantling

4.1 — Machine dimensions



4.2 — Transport and handling of the machine

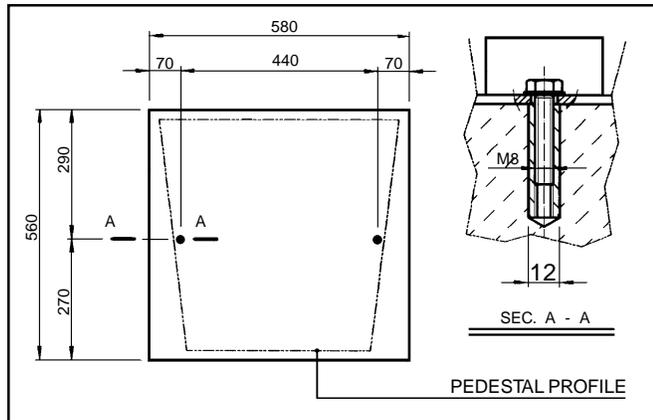
If the machine has to be moved, use a fork-lift truck or sling it with straps as illustrated.



4.3 — Minimum requirements for the premises housing the machine

- Main voltage and frequency complying with the machine motor characteristics.
- Environment temperature from -10°C to +50°C.
- Relative humidity not over 90%.

4.4 — Anchoring the machine

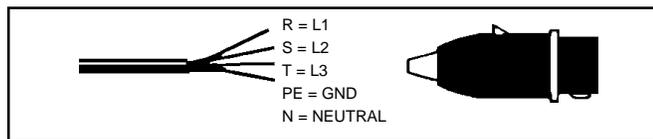


- Position the machine base on a firm cement floor, maintaining, at the rear, a minimum distance of 800 mm from the wall; anchor it to the ground as shown in the diagram, using screws and expansion plugs or tie rods sunk in cement, ensuring that it is sitting level.

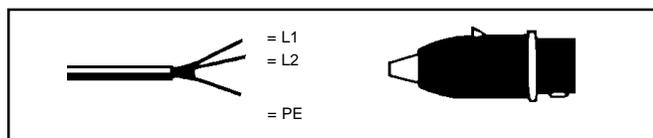
4.5 — Instructions for electrical connection

- The machine may not be provided with an electric plug.

1 – WIRING DIAGRAM FOR 5-WIRE SYSTEM WITH NEUTRAL FOR THREE-PHASE MACHINE - SOCKET FOR A 16A PLUG



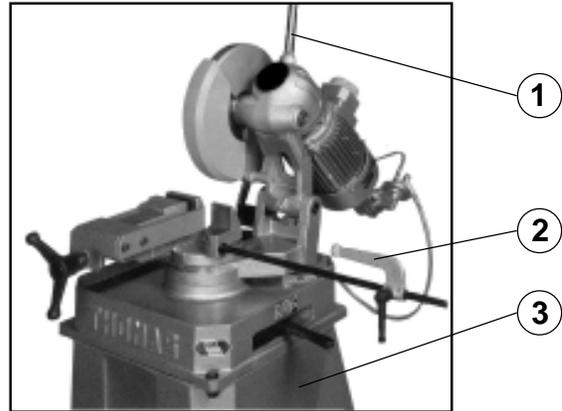
2 – WIRING DIAGRAM FOR THE SINGLE-PHASE SYSTEM SOCKET FOR A 16A PLUG



4.6 — Instructions for assembly of the loose parts and accessories

Attach the components supplied as indicated in the photo:

- part. 1 Screw the lever onto the head
- part. 2 Attach the bar holding rod
- part. 3 Attach the pedestal firmly onto the base



4.7 — Deactivating the machine

If the sawing machine is not to be used for a long period, it is advisable to proceed as follows:

- 1) Detach the plug from the electric supply panel
- 2) Release the head return spring
- 3) Empty the coolant tank
- 4) Carefully clean and grease the machine
- 5) If necessary, cover the machine.

5 Machine Functional Parts

5.1 — Operating head

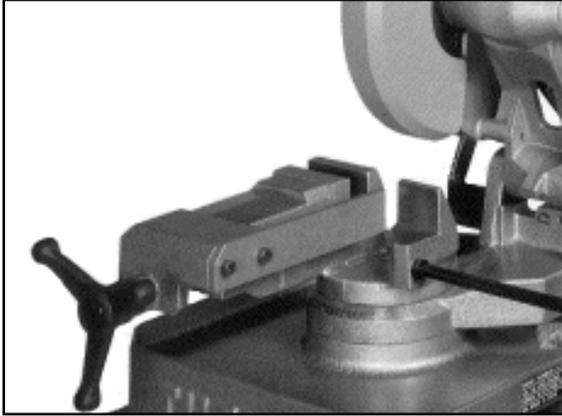
- Machine part composed of the parts that transmit movement (motor, reduction unit), the lubricating coolant pump and the electrical components.



5.2 — Vice

- System for gripping material during the cutting operation, operated with handwheel.

Provided with an anti-burr device for holding the part that is to be cut.



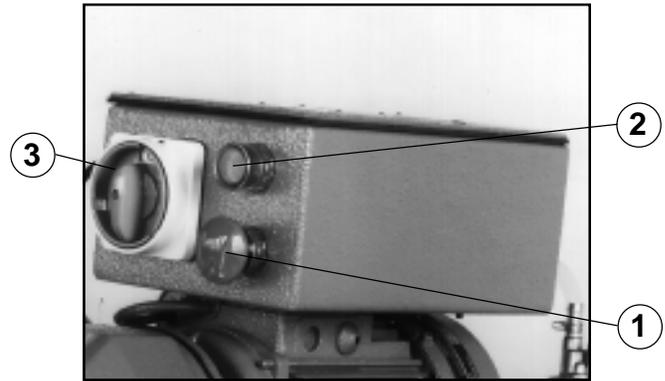
5.3 — Bed

- Support structure for the OPERATING HEAD (rotating arm for gradual cutting, with respective blocking system), the VICE, the BAR STOP, and the housing for the cutting coolant TANK.

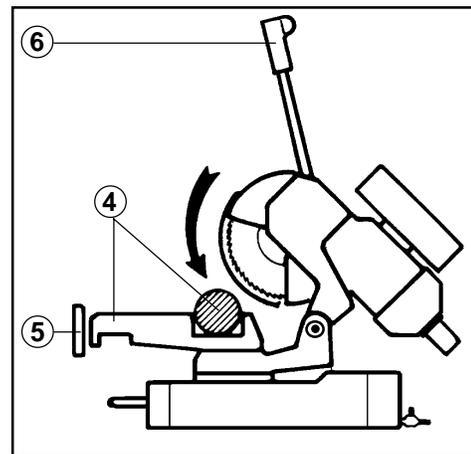


6 Description of the Operating Cycle

6.1 — Starting up and cutting cycle



- Ensure that the machine is not in emergency stop condition; if it is, release the red mushroom button (1).
- Select the cutting speed on the switch (3):
position 1 = 40 rpm
position 2 = 80 rpm
- Press the start/reset button (2): green light will go on.



- Place material to be cut in the vice (4) and clamp the part into place by handwheel (5).
- Grip the handle (6) of the HEAD control arm and press the button, checking that the blade is turning in the direction indicated (if not, invert the two phase leads) and that sufficient coolant is flowing.
- When starting to cut with a new blade, in order to safeguard its life and efficiency, the first two or three cuts must be made while exerting a slight pressure on the part, so that the time taken to cut is about double the normal time** (see below in the chapter on "Material classification and choice of blades" in the section on *Breaking in the blade*).
- Press the red emergency button (1) when there are conditions of danger or malfunctions in general, so as to stop machine operation immediately.

7 *Regulating the Machine*

7.1 — Saw head

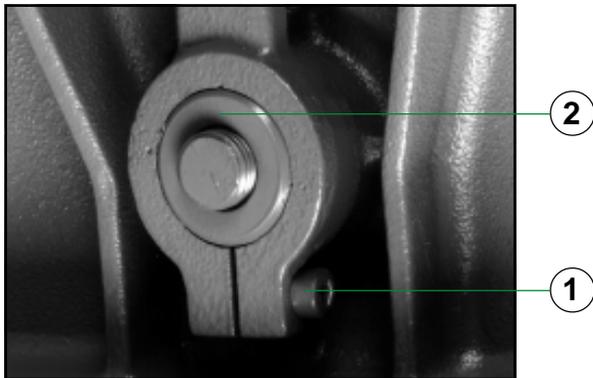
- Does not require any adjustments.

7.2 — Vice

- Does not require any adjustments.

7.3 — Regulating arm blockage

- If there is blockage of the head arm in the desired position, loosen the screw (1) on the lever, hold the bushing (2) in position, turn the lever to the left and re-tighten the screw.

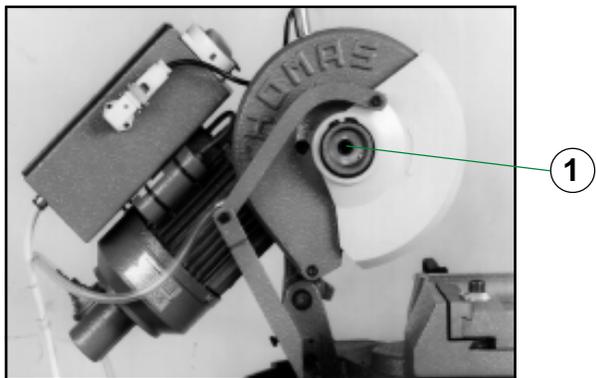


Note: Before performing the following operations, the electric power supply and the power cable must be completely disconnected.

7.4 — Changing the blade

To change the blade:

- Release the guard and push it back.
- Place a piece of wood in the vice and lean the blade on it.
- Insert the special spanner provided and remove the screw (1), loosening it in a clockwise direction, it has a *left-handed* thread, then slip off the flange that holds the blade.



- Attach the new blade, check the direction of the teeth, then replace the flange, the screw and the guard.

7.5 — Changing the lubricating coolant pump

- Remove the lubrication tubing.
- Remove the fastening screws and replace the small pump, being careful to keep the driving stem centred on the drive shaft bearing.

8 *Routine and Special Maintenance*

The maintenance jobs are listed below, divided into *daily, weekly, monthly* and *six-monthly* intervals. If the following operations are neglected, the result will be premature wear of the machine and poor performance.

8.1 — Daily maintenance

- Clean the machine to remove accumulated shavings.
- Top off the level of lubricating coolant.
- Check the blade for wear.
- Lift the head into a high position to avoid yield stress on the return spring.
- Check functionality of the guards and emergency stops.

8.2 — Weekly maintenance

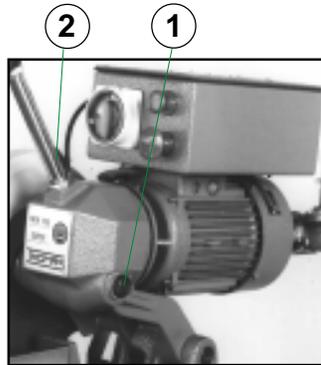
- General cleaning of the machine to remove shavings, especially from the lubricant fluid tank.
- Clean the filter of the suction pump head and the suction area.
- Clean and grease the screw and the sliding guide of the vice.
- Clean the blade housing.
- Sharpen the blade.

8.3 — Monthly maintenance

- Check tightness of the screws on the motor, the pump, the jaws and guards.
- Check that the guards are unbroken.
- Grease the head hinge pin.

8.4 — Six-monthly maintenance

- Change the oil in the reduction unit using oil type GEARCO 85W-140 by NATIONAL CHEMSEERACH or MOBIL GLYCOLE 30 or KLUBER SINTHESO 460 EP or an equivalent oil, proceed as follows:
- Remove the connecting plug from the electric box and un-screw the head moving lever.
- Drain the old oil from the cap at the side (1).
- Pour in new oil up to the mark (1), through the lever fixing hole, keeping the head in a horizontal position (2).
- Reassemble all the parts.
- Check continuity of the equipotential protection circuit.



8.6 — Special maintenance

Special maintenance operations can be carried out by skilled personnel, or contact Parker TFD or distribution personnel.

9 Material Classification and Choice of Tool

Since the aim is to obtain excellent cutting quality, the various parameters such as *hardness of the material, shape and thickness, transverse cutting section of the part to be cut, choice of the type of cutting blade, cutting speed and control of head descent*, must be suitably combined. These specifications must therefore be combined in a single operating condition according to practical considerations and common sense, so as to achieve optimum conditions.

We therefore advise you always to choose original spare blades that guarantee superior quality and performance.

8.5 — Oils for lubricating coolant

Considering the vast range of products on the market, the user can choose the one most suited to his own requirements, using as reference the type SHELL LUTEM OIL ECO.

The minimum percentage of oil diluted in water is 8 - 10 %.

9.1 — Definition of materials

The following table lists the characteristics of the materials to be cut.

| TYPES OF STEEL | | | | | | CHARACTERISTICS | | |
|--|--|------------|-------------|-----------|-----------------|---------------------------|-----------------------------|-----------|
| USE | I UNI | D DIN | F AF NOR | GB SB | USA AISI-SAE | Hardness BRINELL HB | Hardness ROCKWELL HRB | R=N/mm2 |
| Construction steels | Fe360 | St37 | E24 | ---- | ---- | 116 | 67 | 360÷480 |
| | Fe430 | St44 | E28 | 43 | ---- | 148 | 80 | 430÷560 |
| | Fe510 | St52 | E36 | 50 | ---- | 180 | 88 | 510÷660 |
| Carbon steels | C20 | CK20 | XC20 | 060 A 20 | 1020 | 198 | 93 | 540÷690 |
| | C40 | CK40 | XC42H1 | 060 A 40 | 1040 | 198 | 93 | 700÷840 |
| | C50 | CK50 | ---- | ---- | 1050 | 202 | 94 | 760÷900 |
| | C60 | CK60 | XC55 | 060 A 62 | 1060 | 202 | 94 | 830÷980 |
| Spring steels | 50CrV4 | 50CrV4 | 50CV4 | 735 A 50 | 6150 | 207 | 95 | 1140÷1330 |
| | 60SiCr8 | 60SiCr7 | ---- | ---- | 9262 | 224 | 98 | 1220÷1400 |
| Alloyed steels for hardening and tempering and for nitriding | 35CrMo4 | 34CrMo4 | 35CD4 | 708 A 37 | 4135 | 220 | 98 | 780÷930 |
| | 39NiCrMo4 | 36CrNiMo4 | 39NCD4 | ---- | 9840 | 228 | 99 | 880÷1080 |
| | 41CrAlMo7 | 41CrAlMo7 | 40CADG12 | 905 M 39 | ---- | 232 | 100 | 930÷1130 |
| Alloyed casehardening steels | 18NiCrMo7 | ---- | 20NCD7 | En 325 | 4320 | 232 | 100 | 760÷1030 |
| | 20NiCrMo2 | 21NiCrMo2 | 20NCD2 | 805 H 20 | 4315 | 224 | 98 | 690÷980 |
| Steel for bearings | 100Cr6 | 100Cr6 | 100C6 | 534 A 99 | 52100 | 207 | 95 | 690÷980 |
| Tool steel | 52NiCrMoKU | 56NiCrMoV7 | ---- | ---- | ---- | 244 | 102 | 800÷1030 |
| | C100KU | C100W1 | ---- | BS 1 | S-1 | 212 | 96 | 710÷980 |
| | X210Cr13KU | X210Cr12 | Z200C12 | BD2 - BD3 | D6 - D3 | 252 | 103 | 820÷1060 |
| | 58SiMo8KU | ---- | Y60SC7 | ---- | S5 | 244 | 102 | 800÷1030 |
| Stainless steel | X12Cr13 | 4001 | ---- | ---- | 410 | 202 | 94 | 670÷885 |
| | X5CrNi1810 | 4301 | Z5CN18.09 | 304 C 12 | 304 | 202 | 94 | 590÷685 |
| | X8CrNi1910 | ---- | ---- | ---- | ---- | 202 | 94 | 540÷685 |
| | X8CrNiMo1713 | 4401 | Z6CDN17.12 | 316 S 16 | 316 | 202 | 94 | 490÷685 |
| Copper alloys Special brass Bronze | Aluminium copper alloy G-CuAl11Fe4Ni4 UNI 5275 | | | | | 220 | 98 | 620÷685 |
| | Special manganese/silicon brass G-CuZn36Si1Pb1 UNI5038 | | | | | 140 | 77 | 375÷440 |
| | Manganese bronze SAE43 - SAE430 | | | | | 120 | 69 | 320÷410 |
| | Phosphor bronze G-CuSn12 UNI 7013/2a | | | | | 100 | 56.5 | 265÷314 |
| Cast iron | Gray pig iron | | G25 | | 212 | 96 | 245 | |
| | Spheroidal graphite cast iron | | GS600 | | 232 | 100 | 600 | |
| | Malleable cast iron | | W40-05 | | 222 | 98 | 420 | |

9.2 — Choosing the blade

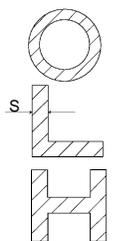
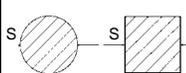
First of all, the pitch of the teeth must be chosen, according to these criteria:

- Parts with a thin and/or variable section such as profiles, pipes and plate, need close teeth, so that the number of teeth used simultaneously in cutting is from 3 to 6;
- Parts with large transverse sections and solid sections need widely spaced teeth to allow for the greater volume of the shavings and better tooth penetration;
- Parts made of soft material or plastic (light alloys, mild bronze, teflon, wood, etc.) also require widely spaced teeth.

9.3 — Teeth pitch

As already stated, this depends on the following factors:

- Hardness of the material
- Dimensions of the section
- Thickness of the wall

| | S (MM) | PICTH | SHAPE | SPEED |
|---|----------|-------|----------|-------|
|  | up to 2 | 4 - 6 | B shaped | 2 |
| | 2 ÷ 5 | 8 | C solid | 2 |
| | 5 ÷ 10 | 8 | C solid | 1 |
|  | up to 20 | 8 | C solid | 1 |
| | 20 ÷ 50 | 10 | C solid | 1 |

9.4 — Cutting and advance speed

The cutting speed (m/min) and the advance speed (cm²/min = area travelled by the blade teeth when removing shavings) are limited by the heat build up at the tips of the teeth.

- The cutting speed is subordinate to the resistance of the material (R = N/mm²), to its hardness (HRC) and to the dimensions of the widest section.
- Too high an advance speed (= blade descent) tends to cause the blade to deviate from the ideal cutting path, producing non rectilinear cuts on both the vertical and the horizontal plane.

9.5 — Breaking in the blade

When cutting for the first time, it is good practice to break in the tool making a series of cuts at a low advance speed (= 30-35 cm²/min on material of average dimensions with respect to the cutting capacity and solid section of normal steel with R = 410-510 N/mm²), generously spraying the cutting area with lubricating coolant.

9.6 — Type of blades

Blades differ in their constructive characteristics, such as:

- Tooth shape
- Tooth cutting angle

Tooth shape

The profile of the teeth depends on the size, shape and thickness of the section to be cut, either straight or at an angle. It may also vary according to the pitch, but not so distinctly as to make this an element for classification.

- Fine teeth are to be chosen for cutting small sections with a profiled shape and tubular sections with thin walls (2-5 mm depending on the material).
- Large teeth are suitable for cutting medium and large solid sections or fairly thick profiled or tubular sections (over 5 mm).

“A” tooling:

Normal fine tooling



“AW” tooling:

Fine tooling with alternate side rake



“B” tooling:

Normal large tooling with or without shaving breaking incision



“BW” tooling:

Large tooling with alternate side rake



“C (HZ)” tooling:

Large tooling with roughing tooth with rake on both sides, alternating with a finishing tooth without rake. The roughing tooth is 0.15-0.30 mm higher.



Added tooling:

Blades made in this way are used for cutting non-ferrous metals, such as light alloys and plastics, and in woodworking. The teeth are hard metal (HM) plates brazed onto the body of the blade; there are various types and shapes and, considering the vastness of the field.

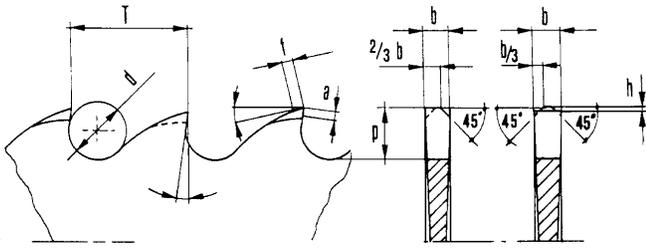
Tooth cutting angle

Each tooth has two cutting angles:

- α : front rake angle
- γ : rear rake angle

Sharpening circular saws

The rake varies especially according to the type of material to be cut.

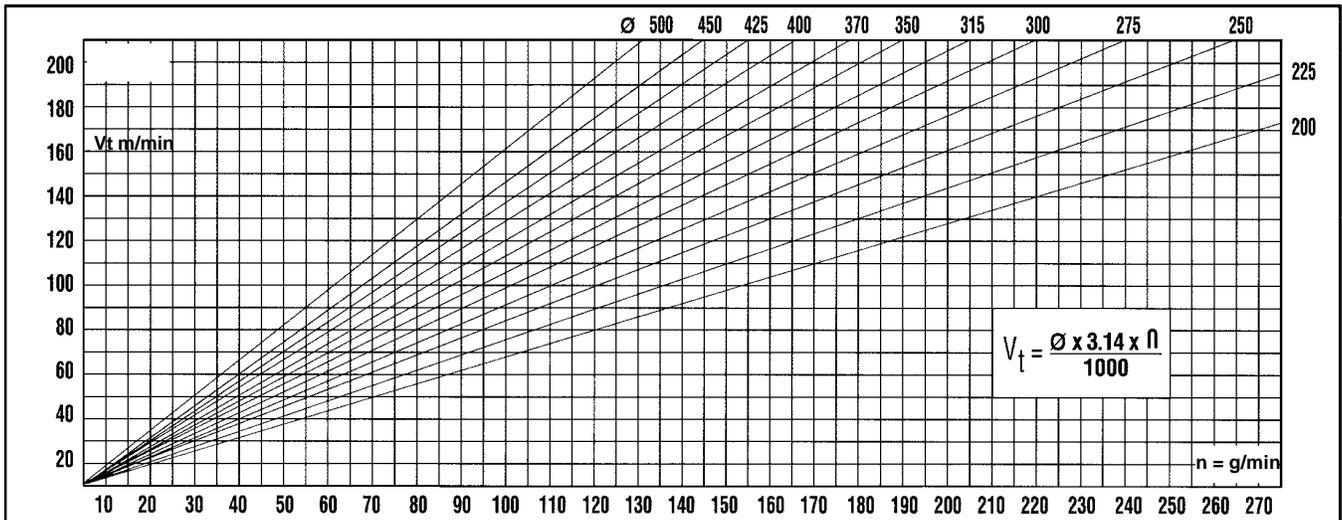


| | | | | | | | | | | | |
|------------|-----|-----|-----|-----|-----|------------|-----|-----|-----|-----|-----|
| T | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 |
| p | 1,3 | 1,6 | 2,1 | 2,5 | 2,9 | 3,4 | 3,8 | 4,2 | 5,1 | 5,9 | 7,2 |
| d | 1,5 | 2 | 2,5 | 3 | 3,5 | 4 | 4,5 | 5 | 6 | 7 | 8 |
| h = 0,2 mm | | | | | | h = 0,3 mm | | | | | |

9.7.1 — Recommended cutting parameters

| | γ | α | Mild steel R = 350-500 N/mm ² | Semi-hard steel R = 500-700 N/mm ² | Hard steel R = 750-950 N/mm ² | Extra-hard steel R = 950-1000 N/mm ² | Heat-treated steel R = 950-1300 N/mm ² | Austenitic stainless steel R = 500-800 N/mm ² | Martensitic stainless steel R = 500-800 N/mm ² | Grey cast iron | Aluminium and alloys R = 200-400 N/mm ² | Aluminium and alloys R = 300-300 N/mm ² | Copper R = 200-350 N/mm ² | Phosphor bronze R = 400-600 N/mm ² | Hard bronze R = 600-900 N/mm ² | Brass R = 200-400 N/mm ² | Alloyed brass R = 400-700 N/mm ² | Titanium and alloys R = 300-800 N/mm ² | Tubes and beams 0.05. D R = 300-600 N/mm ² | Tubes and beams 0.025. D R = 300-600 N/mm ² |
|-----------|---|----|---|--|---|--|--|---|--|----------------|---|---|---|--|--|--|--|--|---|--|
| | | | 20° | 18° | 15° | 12° | 10° | 12° | 15° | 12° | 22° | 20° | 20° | 15° | 12° | 16° | 12° | 18° | 18° | 15° |
| 10 - 20 | | 8° | 5 | 4 | 4 | 3 | 2 | 4 | 4 | 4 | 6 | 5 | 6 | 5 | 4 | 5 | 5 | 4 | 3 | 2 |
| | | | 50 | 30 | 20 | 15 | 9 | 20 | 20 | 25 | 1100 | 200 | 400 | 400 | 120 | 600 | 500 | 50 | 19 | 35 |
| | | | 160 | 130 | 110 | 60 | 35 | 50 | 50 | 100 | 1800 | 400 | 600 | 800 | 160 | 1100 | 700 | 160 | 130 | 130 |
| 20 - 40 | | | 7 | 6 | 6 | 4 | 3 | 6 | 6 | 6 | 8 | 7 | 8 | 7 | 8 | 6 | 7 | 4 | 4 | 3 |
| | | | 45 | 30 | 20 | 15 | 9 | 19 | 19 | 23 | 1000 | 180 | 350 | 400 | 110 | 600 | 400 | 45 | 18 | 33 |
| | | | 150 | 120 | 110 | 60 | 33 | 45 | 45 | 100 | 1700 | 400 | 600 | 700 | 150 | 1100 | 600 | 150 | 120 | 120 |
| 40 - 60 | | | 10 | 9 | 8 | 6 | 4 | 8 | 8 | 8 | 12 | 10 | 11 | 10 | 8 | 10 | 10 | 6 | 5 | 4 |
| | | | 45 | 25 | 18 | 14 | 9 | 18 | 18 | 22 | 900 | 160 | 300 | 350 | 100 | 550 | 350 | 45 | 18 | 30 |
| | | | 140 | 110 | 100 | 50 | 30 | 45 | 45 | 90 | 1600 | 350 | 550 | 700 | 140 | 1000 | 600 | 140 | 110 | 110 |
| 60 - 90 | | | 12 | 12 | 11 | 9 | 6 | 11 | 11 | 11 | 16 | 12 | 14 | 12 | 10 | 12 | 12 | 10 | 6 | 5 |
| | | | 40 | 25 | 17 | 14 | 8 | 17 | 17 | 20 | 800 | 160 | 250 | 300 | 90 | 550 | 350 | 45 | 17 | 30 |
| | | | 130 | 110 | 50 | 50 | 28 | 40 | 40 | 80 | 1400 | 300 | 550 | 600 | 130 | 900 | 500 | 130 | 110 | 110 |
| 90 - 110 | | | 14 | 14 | 14 | 12 | 8 | 14 | 14 | 14 | 18 | 14 | 17 | 14 | 12 | 16 | 16 | 12 | 6 | 5 |
| | | | 40 | 20 | 15 | 13 | 8 | 15 | 15 | 19 | 700 | 140 | 200 | 250 | 70 | 500 | 300 | 40 | 16 | 28 |
| | | | 110 | 100 | 80 | 45 | 25 | 40 | 40 | 880 | 1300 | 300 | 500 | 600 | 110 | 900 | 500 | 110 | 100 | 100 |
| 110 - 130 | | | 16 | 16 | 16 | 14 | 10 | 16 | 16 | 16 | 20 | 16 | 18 | 16 | 14 | 18 | 18 | 14 | 8 | 6 |
| | | | 35 | 20 | 14 | 13 | 7 | 14 | 14 | 17 | 600 | 130 | 150 | 200 | 60 | 500 | 300 | 35 | 16 | 26 |
| | | | 100 | 90 | 70 | 45 | 25 | 35 | 35 | 70 | 1100 | 250 | 500 | 500 | 100 | 800 | 400 | 100 | 90 | 90 |
| 130 - 150 | | | 18 | 16 | 16 | 14 | 12 | 16 | 16 | 16 | 20 | 16 | 20 | 18 | 16 | 18 | 18 | 16 | 10 | 6 |
| | | | 30 | 15 | 12 | 12 | 7 | 12 | 12 | 16 | 500 | 130 | 120 | 150 | 50 | 450 | 200 | 30 | 15 | 24 |
| | | | 90 | 80 | 60 | 40 | 22 | 35 | 35 | 60 | 900 | 250 | 400 | 400 | 90 | 800 | 400 | 90 | 80 | 80 |

9.7.2 — Diagram of cutting speeds according to blade diameter



KEY

- T Tooth pitch in millimetres
- Av mm/min Advance in millimetres per minute
- Vt m/min Cutting speed in metres per minute
- Az Tooth advance
- Ng/min Number of revs per minute
- Z Number of teeth on the blade
- p Tooth depth
- d Diameter of the tooth fillet cone distance
- h Tooth protrusion
- g Front rake
- a Rear rake
- N/mm Ultimate tensile stress
- a-f Flat parts of the cutting edge
- Ø Tube diameter or profile width

10 Machine Components

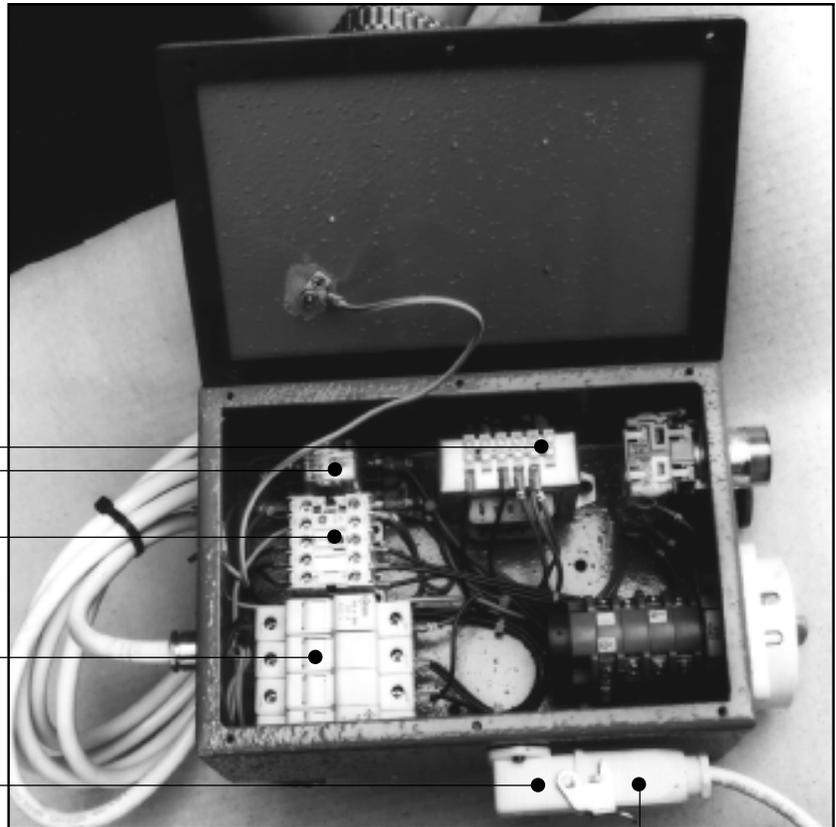
10.1 — List of spare parts

| REFERENCE N° | DESCRIPTION | REFERENCE N° | DESCRIPTION |
|--------------|-----------------------------|--------------|-----------------------------|
| 1 | Machine bed | 46 | Blade |
| 2 | Revolving arm | 47 | Blade shaft flange stakes |
| 3 | Revolving arm locking pin | 48 | Blade shaft flange |
| 4 | Revolving arm locking bush | 49 | Screw M12 |
| 5 | Revolving arm locking lever | 50 | Fixed guard |
| 6 | Screw M8 | 51 | Grain M16 |
| 7 | Pin Ø 6 | 52 | Coolant tube |
| 8 | Countervise | 53 | Mobile guard |
| 9 | Grain M6 | 54 | Ring seeger Ø 60 E |
| 10 | Bar stop rod | 55 | Screw M6 |
| 11 | Bar stop | 57 | Mobile guard rod |
| 12 | Vice | 58 | Ring seeger Ø 10 E |
| 13 | | 59 | Tie rod support pin |
| 14 | | 60 | Tie rod support |
| 15 | | 61 | Screw M8 |
| 16 | | 62 | Pin Ø 4 |
| 17 | Oiler Ø 5 | 63 | Worm wheel |
| 18 | Vice handwheel | 64 | Grain M8 |
| 19 | Pin Ø 6 | 65 | Worm wheel retaining washer |
| 20 | Vice thread | 66 | Screw M12 |
| 21 | | 67 | Ring nut M17 |
| 22 | | 68 | Worm screw |
| 23 | Burr-free plate | 69 | Ring DPSM 25-47-7 |
| 24 | Seal filter support flange | 70 | Front flange |
| 25 | Ring seeger Ø 42 I | 71 | Stud bolt |
| 26 | Tank cover filter | 72 | Washer |
| 27 | Filter support flange | 73 | Nut M16 |
| 28 | Screw M5 | 74 | Bearing 6025 2rs |
| 29 | Washer | 75 | Motor shaft (rotor) |
| 30 | Coolant tap | 76 | Key |
| 31 | Coolant tube | 77 | Motor housing and stator |
| 32 | Screw M6 | 78 | |
| 33 | Tank filter | 79 | Head gasket |
| 34 | Screw M8 | 80 | |
| 35 | Nut M8 | 82 | Motor head |
| 36 | Hinge pin | 83 | Motor rear flange |
| 37 | Grain M6 | 84 | Fan |
| 38 | Nut M6 | 85 | Fan cover |
| 39 | | 86 | Screw M4 |
| 40 | Nut M16 | 87 | Bearing 609 |
| 41 | Head lever | 88 | Pump connexion box |
| 42 | Head lever handgrip | 89 | Screw M5 |
| 43 | Ring SM 30-40-7 | 90 | Coolant pump |
| 44 | Key 8x7x30 | 91 | Screw M6 |
| 45 | Blade shaft | 92 | Oil level-drain plug |
| | | 93 | Return spring connection |
| | | 94 | Head return spring |

PARTS CALLOUT

- 95 Auxiliary relay
- 96 Remote control switch
- 97 Fuse carrier
- 98 Transformer
- 99 Socket connector
- 100 Plug Connector

- 98
- 95
- 96
- 97
- 99
- 100



- 102
- 101
- 103
- 104

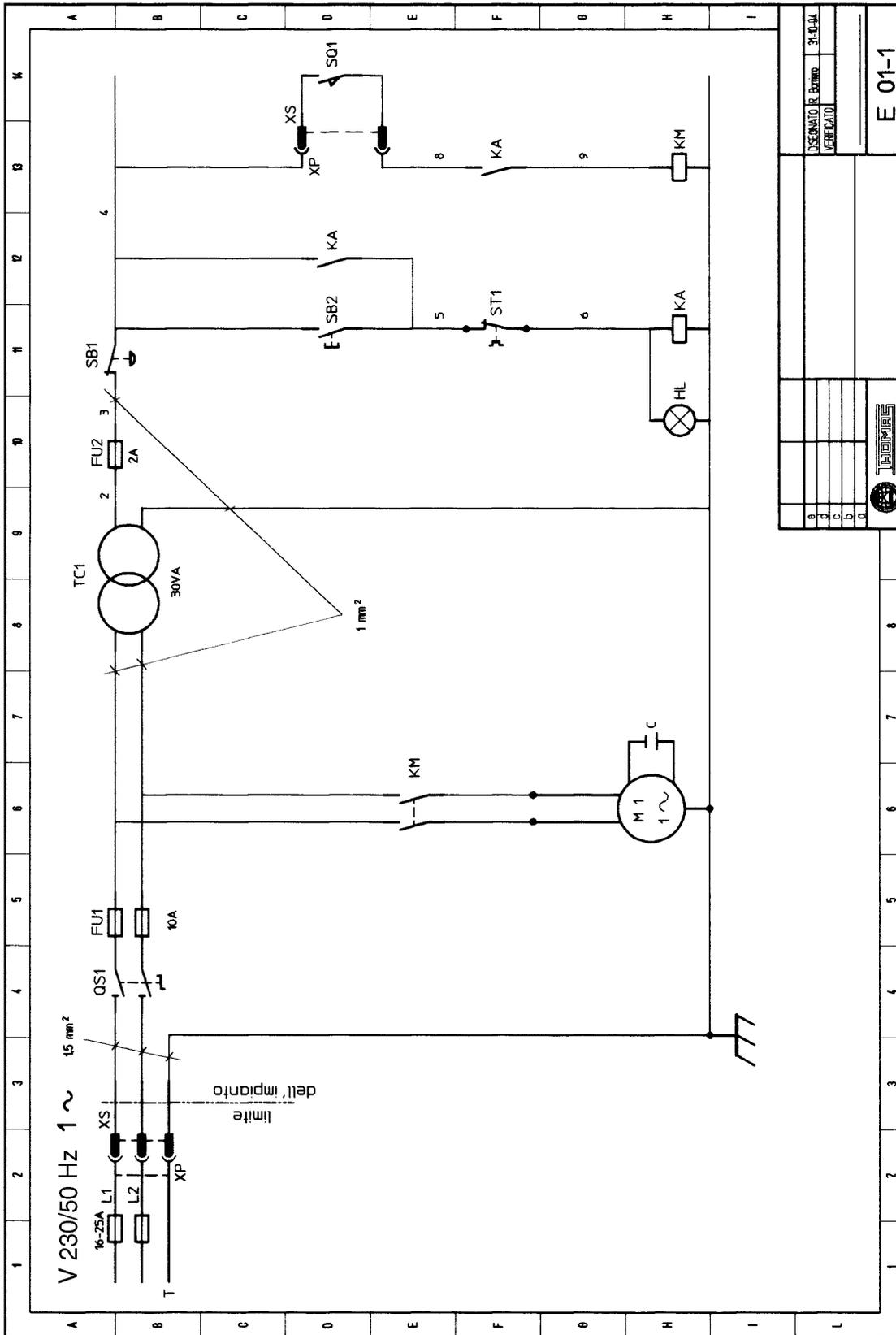
- 105
- 106



PARTS CALLOUT

- 101 Speed switch
- 102 Reset button
- 103 Emergency push button
- 104 Electric components box
- 105 Box cover
- 106 Box gasket

11 Wiring Diagrams



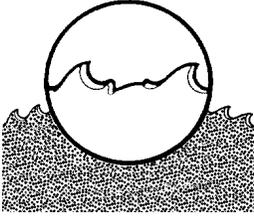
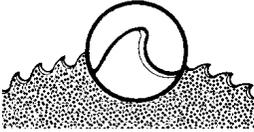
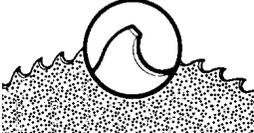
| CODE | DESCRIPTION | CODE | DESCRIPTION | CODE | DESCRIPTION | CODE | DESCRIPTION |
|------|-------------|------|-----------------|------|-----------------------|------|---------------|
| M1 | Disk motor | SB1 | Mushroom button | KM | Remote control switch | ST1 | Thermal probe |
| XP | Soket | SB2 | Luminous button | C | Condenser | | |
| XS | Plug | HL | Pilot lamp | | | | |
| SA | Switch | KA | Auxiliary relay | | | | |

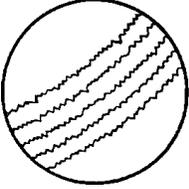
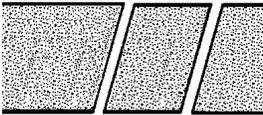
12 Troubleshooting

This chapter lists the probable faults and malfunctions that could occur while the machine is being used and suggests possible remedies for solving them.

The first paragraph provides diagnosis for TOOLS and CUTS, the second for ELECTRICAL COMPONENTS.

12.1 — Blade and cut diagnosis

| FAULT | PROBABLE CAUSE | REMEDY |
|--|--|--|
| <p>TOOTH BREAKAGE</p>  | <p>Advancing too fast Improper cutting speed</p> <p>Improper tooth pitch</p> <p>Low quality blade Ineffective gripping of the part in the vice. Previously broken tooth left in the cut Cutting resumed on a previously made cut.</p> <p>Insufficient lubricant</p> <p>Accumulation of excess material on the blade.</p> | <p>Decrease advance, exert less cutting pressure Change blade speed and/or diameter. See Chapter “Material classification and choice of blades” and the <i>Table of cutting speeds according to blade diameter</i>. Choose a suitable blade. See Chapter “Material classification and choice of blades”.</p> <p>Use a better quality blade. Check the gripping of the part. Remove any excess pieces. Make the cut elsewhere, turning the part.</p> <p>Check the level of the liquid in the tank. Increase the flow of lubricating coolant. Check that the hole and the outlet tubes are not blocked. Check the blend of lubricating coolant and choose a better quality blade.</p> |
| <p>PREMATURE WEAR</p>  | <p>Incorrect running in of the blade</p> <p>Incorrect cutting speed</p> <p>Unsuitable tooth profile</p> <p>Wrong tooth pitch</p> <p>Low quality blade Insufficient lubricating fluid</p> | <p>See Chapter “Material classification and choice of blades” in the paragraph on <i>Running in the blade</i>. Change blade speed and/or diameter. See Chapter “Material classification and choice of blades” and the <i>Table of cutting speeds according to blade diameter</i>. Choose a suitable blade. See Chapter “Material classification and choice of blades” in the paragraph on <i>Type of blades</i>. Choose a suitable blade. See Chapter “Material classification and choice of blades”.</p> <p>Use a better quality blade. Check the lubrication level. Increase the flow of lubricate fluid, check that the hole and the fluid outlet tube are not blocked.</p> |
| <p>CHIPPED BLADE</p>  | <p>Hardness, shape or flaws in the material (oxides, inclusions, lack of homogeneity, etc.) Incorrect cutting speed</p> <p>Incorrect tooth pitch</p> <p>Vibration Blade incorrectly sharpened</p> <p>Low quality blade Incorrect emulsion of the lubricating refrigerant</p> | <p>Reduce the cutting pressure and/or the advance.</p> <p>Change blade speed and/or diameter. See Chapter “Material classification and choice of blades” and the Table of cutting speeds according to blade diameter. Choose a suitable blade. See Chapter “Material classification and choice of blades”.</p> <p>Check gripping of the part. Replace the blade with one that is more suitable and correctly sharpened. Use a better quality blade. Check the percentage of water and oil in the emulsion.</p> |

| FAULT | PROBABLE CAUSE | REMEDY |
|---|---|---|
| <p>BLADE VIBRATION</p> | <p>Incorrect tooth pitch</p> <p>Unsuitable tooth profile</p> <p>Ineffective gripping of the part in the vice Dimensions of the solid section too large with respect to the maximum admissible cutting dimensions</p> <p>Blade diameter incorrect and/or too large</p> | <p>Choose a suitable blade. See Chapter “Material classification and choice of blades”.</p> <p>Choose a suitable blade. See Chapter “Material classification and choice of blades” in the paragraph on <i>Type of blades</i>.</p> <p>Check the gripping of the part. Refer to the instructions.</p> <p>Decrease the blade diameter, adapting it to the dimensions of the part to be cut. The cutting part of the blade must not be too large for the shape of the part to be cut.</p> |
| <p>RIDGES ON THE CUTTING SURFACE</p>  | <p>Blade diameter incorrect and/or too large</p> <p>Ineffective gripping of the part in the vice</p> <p>Fast advance</p> <p>Blade teeth are worn</p> <p>Insufficient lubricating fluid</p> <p>Teeth do not disperse shavings well</p> | <p>Decrease the blade diameter, adapting it to the dimensions of the part to be cut. The cutting part of the blade must not be too large for the shape of the part to be cut.</p> <p>Check the gripping of the part. Decrease advance. Exert less cutting pressure. Sharpen the blade.</p> <p>Check the level of the liquid in the tank. Increase the flow of lubricant fluid. Check that the hole and the fluid outlet tube are not blocked.</p> <p>Choose a blade with a larger tooth pitch that allows better unloading of shavings and that holds more lubricating fluid.</p> |
| <p>CRODGED CUTS</p> | <p>Fast advance</p> <p>Ineffective gripping of the part in the vice</p> <p>Blade head not straight</p> <p>Blade sides differently sharpened</p> <p>Blade thinner than the commercial standard</p> <p>Dirt on the gripping device</p> | <p>Decrease advance. Exert less cutting pressure. Check the gripping of the part. Adjust the head.</p> <p>Choose tool quality carefully in every detail as regards type and construction characteristics. Carefully clean the laying and contact surfaces.</p> |
| <p>BLADE STICKS IN THE CUT</p>  | <p>Fast advance</p> <p>Low cutting speed</p> <p>Wrong tooth pitch</p> <p>Accumulation of material on the blade</p> <p>Insufficient lubricating fluid</p> | <p>Decrease advance. Exert less cutting pressure. Increase speed.</p> <p>Choose a suitable blade. See Chapter “Material classification and choice of blades.”</p> <p>Check the blend of lubricating coolant and choose a better quality blade.</p> <p>Check the level of the liquid in the tank. Increase the flow of lubricating fluid. Check that the hole and the liquid outlet tube are not blocked.</p> |

12.2 — Electrical components diagnosis

| FAULT | PROBABLE CAUSE | REMEDY |
|--|---|--|
| <p>THE GREEN PILOT LIGHT “HL” DOES NOT LIGHT UP</p> | <p>Fused lamp Power supply</p> <p>Fuses “FU 1” Short circuits Speed switch “SA” in position “0” Emergency button “SB 1” on Cycle reset or line button “SB 2” Thermal probe built into the stator winding has tripped due to motor overheating</p> <p>Transformer “TC 1”</p> <p>Fuse “FU 2”</p> <p>Auxilliary relay “KA”</p> | <p>Change it.</p> <p>Check:</p> <ul style="list-style-type: none"> • Phases • Cables • Socket • Plug <p>Voltage must arrive upstream from the fuses.</p> <p>Check for efficiency.</p> <p>Identify and eliminate.</p> <p>It must be turned to position 1 or 2.</p> <p>Ensure that it is off and that its contacts are unbroken.</p> <p>Check mechanical efficiency.</p> <p>Check current continuity on the two wires in the prone after letting the motor cool for about 10-15 minutes. If after this time there is no current continuity in the two wires, the motor must be changed or rewound.</p> <p>Check that the supply voltage is the same as the line voltage and that it gives a value of 24 V at output.</p> <p>Check fuse efficiency and ensure there are no short circuits causing the protection to trip.</p> <p>Check that 24 V reach the coil terminals when the button “SB 2” is pressed. If this happens and the relay is not self-fed, it must be changed.</p> |
| <p>MOTOR STOPPED WITH PILOT LIGHT “HL” LIT</p> | <p>Socket and plug connecting the electric box/microswitch in the handle Microswitch “SQ 1” in the handle Remote-control switch “KM”</p> <p>Motor “M 1”</p> | <p>Check that the plug is correctly inserted and look for any bad connections inside the box.</p> <p>Check operation and/or efficiency. Replace if broken.</p> <p>Check that phases are present at both input and ouput.</p> <p>Ensure that it is not blodked, that it closes when fed, that it does not cause short circuits. Otherwise change it.</p> <p>Check that it is not burnt and that it turns freely.</p> <p>It may be rewound or changed.</p> |

13 Noise Tests

In accordance with point 1.7.4.f of the Machines Directive EEC 89/392.

INTEGRATING PHONOMETER “DELTA OHM” mod. HD9019K1 serial n. 110996B295.

MICROPHONE mod. HD 9019S1.

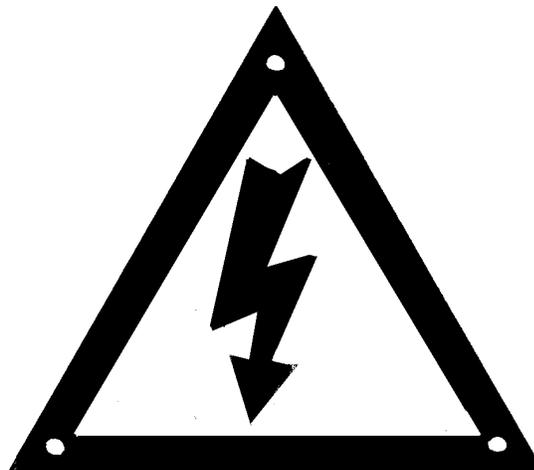
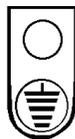
SOUND GAUGER mod. HD 9101at 94dB/110dB a 1.000 Hz in class 1 according to IEC regulation n. 942 1988 and ANSI S1.40 1984.

3 measurements with the machine operating unloaded.

- The microphone was been located close to the operator’s head, at medium height.
- The weighted equivalent continuous acoustic pressure level was 77.6 dB (A).
- The maximum level of the WEIGHTED instantaneous acoustic pressure C was always less than 130 dB.

NOTE: With the machine operating, the noise level will vary according to the different materials being processed. The user must therefore assess the intensity and if necessary provide the operators with the necessary personal protection, as required by Law 277/1991.

Plates and Labels



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9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

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If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

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Ft. Wayne, IN
(219) 747-3111
(219) 747-3026 FAX

**Minneapolis Region
Sales Office & Service Center**
Minneapolis, MN
(612) 469-5000
(612) 469-5729 FAX
Service Center
Oshkosh, WI 54901
(414) 426-8471
(414) 426-8570 FAX

**Northeast Region
Sales Office & Service Center**
Trenton, NJ
(609) 586-5151
(609) 586-3149 FAX

**Pacific Region
Sales Office & Service Center**
Portland, OR
(503) 283-1020
(503) 283-2201 FAX
Service Center
Buena Park, CA
(714) 522-8840
(714) 994-1183 FAX

**Southeast Region
Sales Office & Service Center**
Greensboro, NC
(336) 373-1761
(336) 378-0913 FAX
Service Center
Conyers, GA
(770) 929-0330
(770) 929-0230 FAX

**Southwest Region
Sales Office & Service Center**
Mansfield, TX
(817) 473-4431
(817) 473-8078 FAX

**Canada
Sales Office & Service Center**
Grimsby, ON
(416) 945-2274
(416) 945-3946 FAX
**(Contact Grimsby for other
Service Center locations.)**



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